EPA February 18, 2010 CDF Performance Standards Comments and LWG April 14, 2010 Responses

Performance Standard – EPA Comment	LWG Designation as Feasibility Study or Design Issue?	LWG Response	LWG Notes on EPA Verbal Clarifications to LWG Questions During March 10, 18, and 29, 2010 Meetings
1. General – Directive nature of comments.	NA	To date, the FS methods discussions have been collaborative and have often avoided directive comments that require formal responses before dispute deadlines expire. This collaborative approach works better for an expedited FS and avoids potential process delays created by the need for formal responses, dispute extensions, and dispute decisions. We request EPA withdraw these comments as directive and clarify them as guidance to help expedite resolution of these issues. Or at a minimum, we request EPA withdraw as directive those comments designated here as "design" level issues, given that FS evaluations don't typically address this level of detail. We request that EPA instead designate these design level comments as guidance that will primarily be addressed in future designs (post-ROD).	EPA indicated that potential clarification of some comments as non-directive depended on the type of objections or potential disagreements that LWG might have on the standards. There might be some situations where EPA might indicate a particular issue can be considered guidance instead of directive.
2. General – Date of comments and relationship to FS schedule.	NA	Given that this information came two months after EPA's December 18, 2009 FS comments (which was significantly after LWG's requests for such information in the fall of 2009) and that LWG indicated that all major FS issues need to be resolved by the end of February 2010 to keep the project on schedule, these comments are extending the expedited FS schedule.	EPA agreed with the LWG assessment that the timing of the submittal of the draft FS was delayed commensurate with the amount of time after the end of February 2010 it takes to resolve issues with the standards.
3. Letter - The LWG shall evaluate any CDFs proposed in the FS using the enclosed performance standards. These performance standards will be considered just one facet of a sensitivity analysis of the performance of various CDF designs, and the LWG shall determine the feasibility and costs of CDF designs that fully achieve these performance standards. LWG may evaluate other CDF designs and performance standards in the FS, and compare the feasibility, costs, and protectiveness of these alternative CDF designs to CDF designs that comply with EPA's specified performance standards. EPA encourages this sensitivity analysis approach because we believe it will provide the public with a clearer picture of which design factors most affect CDF performance, protectiveness, and cost.	FS Issue	The LWG agrees that alternative performance standards should be presented in the FS process. We believe it will provide more realistic options that EPA will need to select from during Proposed Plan and ROD development. The LWG will present the EPA water quality performance standards and alternative performance standards at the screening check-in based on the understandings outlined below. Design-level performance standards would be addressed in the FS as described below.	EPA added that it was acceptable to view any LWG proposed alternative approaches to performance standards at the screening check-in, as opposed to asking for more input now from LWG on the content of those alternative approaches.
4. Letter - EPA considers that the enclosed performance standards would be generally applicable to confined aquatic disposal facilities as well as CDFs; however, additional performance standards may need to be developed to address issues specific to confined aquatic disposal, such as: • Control of placement of contaminated sediments • Allowable water quality impacts • Scour protection during flooding (possibly including floods in excess of the 100-year • event)	FS Issue	Given that LWG has been requesting this type of information since, at least, the fall 2009, any additional comments from EPA on CAD standards or any other details of the FS methods will have further schedule implications. The LWG has noted before that the FS evaluations of cap, CAD, and CDF technologies should be conducted on a consistent basis because this is the most technically sound approach. To the extent that any future CAD comments differ from the existing cap and CDF comments, this will	EPA indicated that it is unlikely that another letter on CAD sites will come from EPA. EPA indicated that this comment was included in the letter as "just in case" language. EPA indicated they understand that a later letter on CAD standards would further delay the FS schedule. EPA indicated that at this time the CDF standards should be applied to CADs as well, where applicable.

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• Cap material, thickness, placement technique, and long-term stability • Physical intrusion into the floodway and navigation channel • Interim capping and protection during dormant periods.		create a further departure from this preferred consistent approach.	
5. General – Design level of detail of some of EPA's comments.	NA	Many of EPA's comments address aspects of CDF design that are normally not addressed in an FS level analysis and should not be addressed one way or the other in this FS. The LWG proposes proceeding with the FS with the understanding that these design level issues will be addressed in brief qualitative text and without specific quantitative estimates or costing. The LWG proposed in the March 29 meeting, and continues to propose, that each design level standard (as designated by LWG) will be qualitatively and briefly discussed in a manner that compares between alternatives. Accordingly, specific quantitative estimates related to costs, feasibility, or effectiveness will not be developed in the FS for these design level standard issues.	On March 10th, EPA indicated that the LWG should use these design level comments if these issues "come up" in the FS. EPA further commented on March 18th that some aspects of these design issues are still part of an FS evaluation in a basic sense. The example of stormwater and utility lines was discussed. It was tentatively agreed the FS could discuss very approximately the number and types of such utilities that might exist for a CDF site and to what extent handling those utilities might impact the approximate overall cost or feasibility of design. It was discussed that this concept could be extended to other design level comments.
Design – *The CDF shall be designed to:*			
6. Contain the volume, level, and characteristics of contaminated sediment to be placed within it, using site-specific designs as needed to accommodate the specific contaminated materials proposed for disposal. The CDF shall be designed to achieve these performance standards when filled with the specified design volume of contaminated sediment meeting CDF sediment acceptance criteria that will be established, considering representative sediment contaminant concentrations and contaminant mobility data obtained from, or estimated for, sediments from Portland Harbor sites where dredging is a reasonably anticipated remedial action that would generate sediments requiring confinement.	FS Issue	The FS will evaluate at a general level the extent to which a CDF can be designed to protectively contain the sediments proposed for dredging under various alternatives.	None.
7. Minimize physical intrusion into waters of the US.	FS Issue	Noted, assuming EPA's March 18th clarification noted in bold is confirmed in writing by EPA. FS would normally consider to what extent a CDF would intrude into waters of the U.S. and cause navigation or flood concerns. However, the level of allowable physical intrusion of a CDF into waters of the U.S. should be determined in the FS by an ARARs evaluation, not by a vague standard to "minimize" intrusion.	EPA indicated that the ARAR (CWA Section 404) includes language to avoid, "minimize", and then mitigate. **EPA agreed that compliance with the ARAR, as normally evaluated on similar projects, would determine compliance with this standard.**
8. Minimize water flow into and out of the CDF, including preventing or restricting preferential flow paths of clean or contaminated groundwater into or out of the CDF. The evaluation should include identifying, removing or modifying utilities trenches, storm drain lines, wells, and other conduits within 500 feet of the CDF (or other distance as determined to be appropriate). Utilities, storm drain lines and other conduits are not allowed under or within the contaminated sediment fill prism.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. An FS would not normally get into details of indentifying and removing specific utilities or how specific utilities or potential preferential pathways might factor into future designs.	The example of stormwater and utility lines was discussed during the March 18th meeting. It was tentatively agreed the FS could discuss very approximately the number and types of such utilities that might exist for a CDF site and to what extent handling those utilities might impact the approximate overall cost or feasibility of design.

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9. Achieve confinement of all hazardous substances disposed of in the facility through the groundwater pathway so that the CDF does not contribute any long- term discharge and/or release of contaminants above applicable and relevant and appropriate requirements under federal or state law for surface water in the lower Willamette River.	FS Issue	The FS will consider potential impacts to water quality through groundwater pathways by comparing long term discharge estimates to appropriate surface water quality criteria.	None.

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10. Limit contaminant concentrations in groundwater (including berm pore water) exiting the CDF to levels below EPA's national recommended chronic water quality criteria for both aquatic organisms and fish consumption by humans (17.5 g/day), more stringent Oregon water quality standards, and MCLs without dilution in the water column. This should include dormant periods between CDF filling, and after closure. Analyses for meeting these criteria shall not consider biodegradation of contaminants within the CDF.	FS Issue	Disagree. The standard is vague as compared to, for example, the cap evaluation approach described in EPA's December 18, 2009 FS guidance comments. The appropriate technical approach is for the CDF standards to be consistent with cap (and CAD) standards. The FS CDF (and other technology) chemical concentration predictions should be compared to water criteria over a spatial extent (vertical and horizontal) that is consistent with the exposure area that is normally addressed in the application of these criteria. The comment also indicates that no biodegradation should be assumed to take place for the purposes of modeling. This is contrary to LWG's understanding of past comments by EPA on both the Portland Harbor chemical fate/cap modeling methods as well as T4 design modeling methods. The EPA required performance standards and assumptions are sufficiently conservative (particularly in combination) that they would greatly increase the assumed costs associated with CDFs to such an extent that it could unfairly bias the FS analysis. Similarly, if these standards and assumptions are applied to caps it would make typical isolation caps (e.g., 1 to 3 feet of clean sand) infeasible for much of the localized AOPC areas (e.g., assuming no chemical biodegradation for any chemicals, including polycyclic aromatic hydrocarbon compounds). With EPA's clarifications, it is our understanding that EPA is still requiring an analysis using the groundwater discharge performance standards and assumptions stated in the EPA comments and in their verbal clarifications. However, we also understand that EPA agrees to allow the LWG to propose alternative groundwater discharge performance standards and assumptions to better understand the implications of the EPA required performance standards, and to use the appropriate alternative performance standards and assumptions in the detailed evaluation of the FS based on this analysis. **On this basis, LWG agrees to move forward with these evaluations through the screening phase of the FS, but we are on record as disagreeing with the technical reasoning for this approach. Further, LWG will present a comparative evaluation of performance standards and assumptions in the Alternatives Screening check in and the LWG will seek EPA approval at that time of its recommended path forward consistent with the findings of those evaluations.**	EPA asked for more description of how the comment is vague, which resulted in additional EPA verbal clarifications of EPA positions as follows: • Horizontal spatial averaging for fish consumption criteria should be allowed for CDF evaluations. The spatial extent is defined as the area of the CDF berm face. • All other criteria should be applied on a point by point basis (whether or not such criteria would be applied in that manner in other contexts). • No dilution in the water column should be allowed for any of these criteria. • Comparison of all criteria to estimated discharges of groundwater to surface water should be made within the berm sand (not rip rap) immediately prior to entering the surface water. EPA stated that, for the T4 project, EPA previously decided that no biodegradation will be allowed. For the Portland Harbor FS, EPA indicated that EPA's biodegradation rate agreement only applied to the site-wide MNR/recontamination model. EPA indicated that caps, CADs, and CDFs should be evaluated assuming zero biodegradation rate in the FS. Per comment 3, EPA indicated that the LWG can provide evaluations assuming non-zero biodegradation rates as long as the EPA requested zero biodegradation evaluations that also conform to other standards in these comments are presented. The LWG sought clarification on March 29 that EPA's requirement to not allow any dilution in surface water applies to mechanisms taking place in the actual surface water body. The LWG indicated this prohibition was assumed to not include mechanisms of surface water exchange that occur within sediment near the sediment/surface water interface. EPA agreed that their prohibition of accounting for surface water dilution was limited to mechanisms that occur within the water column itself, not within the surface sediment.

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10. (continued)			On March 29, EPA also indicated that it was not their intent to unfairly bias the FS analysis away from CDFs or to preclude capping in areas that would normally be expected to be feasibly capped. However, EPA indicated that they could not alter their proposed groundwater discharge performance standards or assumptions without a more detailed understanding of the basis for the LWG's contentions.
11. CDFs shall be designed in a manner that is consistent with the Remedial Action Objectives and Management Goals that have been established for the Feasibility Study. Habitat mitigation and land acquisition assumptions for individual CDFs shall be developed for cost estimating purposes in the FS.	FS Issue	The FS will assess consistency with RAOs and management goals. Habitat mitigation and land costs will be included at a conceptual level and/or as a cost range.	None.
12. CDF Berms shall be designed to: • Provide a static safety factor of 1.5 or greater and a seismic safety factor of 1.1 or greater. The design seismic event shall correspond to a 10 percent probability of exceedance in 50 years. • Be resistant to erosive forces by the largest of 100-year flood flow, 100-year waves, vessel-induced waves from typical passing vessels, and anticipated propeller wash from vessels that operate in the area. • Have an appropriate gradation to allow transport of groundwater while retaining (filtering) sediment during filling and after closure.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. FS would not normally determine detailed seismic and erosion requirements. The FS would consider generally that the CDFs would have to be robust enough to prevent routine failure or erosion. See next comment regarding flood modeling.	None.
13. Construction of any CDF shall not measurably increase the 100-year flooding stage or decrease flood storage of the Willamette River. The FS shall consider cumulative effects of multiple sites and related remedial actions including sediment capping.	FS Issue	Flood assessment modeling will be conducted for the FS at a comprehensive alternative level, but not for individual parts of the alternative (e.g., just a CDF). Given this approach, we agree that the FS will generally evaluate so called "cumulative" effects represented by the entirety of each comprehensive alternative.	EPA clarified that they regard this as an FS level issue. LWG agrees, per the response.
14. Maintain saturated or unsaturated conditions (as appropriate) within the confined contaminated sediments prism, considering reasonably anticipated seasonal and long-term cyclical groundwater levels, and considering site infiltration or zero recharge (as appropriate) from the overlying ground surface, to eliminate or reduce potential mobility of chemicals of concern.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will approximately estimate the elevation a CDF could be filled to using maintenance of saturated conditions as a guiding principle. However, it will not contain a detailed evaluation of long term groundwater cycles and levels of site infiltration.	None.
15. Minimize releases of 303(d) listed contaminants to the extent practicable.	FS Issue	Noted. The FS will consider to what extent a CDF might release contaminants, including 303(d) contaminants, through an evaluation of compliance with ARARs. However, this will be a qualitative evaluation in the FS for most 303(d) contaminants, given that every potential chemical will not be modeled.	EPA indicated that the standard is consistent with the language in the ARARs. EPA agreed that the LWG could take the approach of evaluating compliance with the ARARs in the FS and the LWG can understand this to comply with the standard as written here. EPA indicated that such evaluations should be sure to include consideration of all the 303d listed chemicals in the Lower Willamette. The LWG assumes this means those chemicals listed for RM 0-24.8 of the Lower Willamette River.

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16. Unless modified by EPA, all CDFs shall be designed to meet these performance standards, ARARs and the final Portland Harbor ROD requirements in perpetuity.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will evaluate compliance with the standards and ARARs that LWG agrees with per these responses and at the level of detail appropriate to an FS per responses on design level comments. The FS cannot evaluate compliance with Portland Harbor ROD requirements that do not exist at this time.	None.
Construction and Filling:			
17. Construct the CDF berm and related components in a manner that minimizes to the extent practicable water quality exceedances within the construction zone and achieves compliance with water quality criteria/standards at and beyond the specified point of compliance.	FS Issue	Assuming EPA's March 18th clarification noted in bold is confirmed in writing by EPA, the FS will evaluate compliance with water quality ARARs during construction and filling of CDFs, but will not evaluate the same operations against a vague standard of "minimization".	EPA indicated that the ARAR (CWA Section 404) includes language to avoid, "minimize", and then mitigate. **EPA agreed that compliance with the ARAR, as normally evaluated on similar projects, would determine compliance with this standard.**
18. Construct the CDF in a manner that minimizes impacts to fisheries and wildlife by removing fish to the extent practicable from the CDF area before and during berm construction.	Design Issue	If EPA agrees to the overall proposed LWG approach to design level issues as noted above, this will be addressed in the FS. The FS will not discuss construction details like removing fish from the CDF area before construction. The FS will generally discuss that currently undetermined construction measures may be required to minimize impacts to fish and wildlife.	None.
19. Construct the CDF berm with acceptable material. For cost estimating purposes, acceptable material should be based on requirements established in the December 2003 Technical Plans and Specifications (Ecology and the Environment 2003) for the McCormick & Baxter sediment cap located within the Willamette River. Materials will generally be imported clean granular material, but typically all materials shall be free of roots, inappropriate organic material, contaminants, and all other deleterious and objectionable material. However, CDF berm construction material shall have an organic fraction meeting minimum specified values consistent with contaminant transport modeling.	Design Issue	Per the Comment 5 proposed overall approach on design level issues, the LWG proposes to address this design level issue qualitatively and briefly in the FS in a manner that compares between alternatives. The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will assume that the berm would be made of relatively clean material, but would not have a specification such as noted in the comment. For FS cost purposes, a range of potential clean source materials that could meet Organic Carbon (OC) requirements will be assumed.	None.
20. Accept only sediments meeting final sediment acceptance criteria. EPA shall approve all sediment to be disposed of in any CDF.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5 with the following understanding: • Because no final acceptance criteria for Portland Harbor CDFs have been yet specified by EPA, the FS cannot consider them explicitly. The FS will assess at a general level the potential for any materials to	None.

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		cause short term or long term violations of water quality ARARs to make this determination, consistent with LWG responses on other related performance standards.	
21, Plan and manage the CDF filling to avoid any short-term overflow(s), or minimize the overflows to the extent possible. If a CDF overflow during filling cannot be avoided, complete an analysis of overflow discharge rates and duration, contaminant concentrations, and ability to meet water quality criteria at end of pipe. Evaluate BMPs and treatment options needed to meet water quality criteria at the end of the pipe. If EPA agrees that criteria cannot be met at the end of the pipe then a dilution zone modeling analysis of the discharge impacts shall be completed to demonstrate compliance with water quality criteria. Overflows must meet acute water quality criteria. Chronic water criteria will be used to guide implementation of BMPs to minimize contaminant loadings to the river. The design shall consider engineering controls and treatment options needed to meet chronic discharge criteria at end of pipe.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will generally consider to what extent overflow discharges would be necessary and if so, generally evaluate the likely water quality levels near the point of discharge and compare them to acute criteria. However, detailed analyses of discharge rates, dilution zone modeling, or determination of detailed BMPs relative to any expected chronic exceedances will not be determined.	EPA indicated that CDF evaluations in the FS should start by assuming the CDF would not have a surface water connection to the river. If this turns out to be infeasible or extremely costly, the FS could then evaluate the potential impacts of allowing overflow only during filling. This evaluation would also assume that the surface water connection would be closed off between filling projects. For CADs, EPA indicated that interim cover should be assumed to be needed between filling projects. EPA indicated the FS should assume that cover would need to be placed at the end of each construction season.
22. During CDF filling, concentrations in groundwater (berm pore water) exiting the CDF must meet acute water quality criteria. Chronic water criteria will be used to guide implementation of BMPs to minimize contaminant loadings to the river. For the CDF, short-term water quality impacts are defined as the period from the beginning of the fill activity until the water level in the CDF reduces to within 0.1 foot of the water level in the river.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will not evaluate concentrations in groundwater short term, determine specific BMPs to minimize these short term concentrations, or define the "short term" period specifically (other than they are defined as during the construction phase).	None.
23. Physically close any hydraulic connection between river and the CDF (except through groundwater) except during periods of actual approved overflow.	FS Issue	The FS will consider to what extent overflow discharges would be generally necessary and if so, generally evaluate the likely water quality levels near the point of discharge and compare them to acute criteria. However, detailed analysis of discharge rates, dilution zone modeling, or determination of detailed BMPs relative to any expected chronic exceedances will not be determined. Per EPA's clarification, potential impacts of surface water moving through the berm will be generally discussed in the FS, but no specific quantitative estimates of this process will be made.	EPA indicated that CDF evaluations in the FS should start by assuming the CDF would not have a surface water connection to the river. If this turns out to be infeasible or extremely costly, the FS could then evaluate the potential impacts of allowing overflow only during filling. This evaluation would also assume that the surface water connection would be closed off between filling projects. Also, the LWG inquired if EPA is requiring the closure of the surface water connection to water behind the berm that could move through the berm before CDF is fully filled. EPA indicated that this pathway should be evaluated to determine the likelihood of any substantial impacts on surface water. If impacts are likely via this pathway, then the FS should assume that measures would be added to the CDF construction to minimize this impact.
24. Prior to final closure of any CDFs, the facility shall be managed in a manner that minimizes impacts to fisheries and wildlife. Potential and short-term exposures of fish and wildlife to contaminated sediments and/or water within a CDF shall be fully	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will consider at a general level to what extent impacts to fisheries and	None.

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assessed and disclosed.		wildlife could occur due to CDF operation and will discuss that currently undetermined operational measures may be required to minimize impacts to fish and wildlife. The FS will not discuss operation details regarding minimizing fish and wildlife impacts and will not include detailed estimates of exposures.	
25. Cap contaminated sediments with clean soils/sediment, or soils/sediments that meet specific acceptance criteria that are established by EPA.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will assume that the cap would be made of relatively clean material, but comparisons cannot be made to a specification that does not exist at this time.	None.
26. Stormwater discharges or infiltration of stormwater into the CDF is not allowed.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will discuss conceptually that stormwater discharge or infiltration through a CDF is generally to be avoided, but will not describe a design for rerouting or otherwise handling stormwater discharges in the CDF area.	None.
Long-Term:			
27. Monitor CDF(s) in perpetuity, or until reduced monitoring is approved by EPA, to document that the CDF(s) achieves confinement of all hazardous substances placed in it so that the facility does not contribute any discharge and/or release of contaminants above performance standards/ROD criteria for surface water or sediment in the lower Willamette River.	FS Issue	The FS will discuss at a conceptual level the need for long term monitoring of all aspects of comprehensive alternatives to confirm whether ROD cleanup levels and ARARs are being met. However, it is impossible for the FS to consider any specifics of monitoring related to assessing attainment of ROD standards, criteria, and ARARs that have not been established yet. In general, specific monitoring plan requirements or performance standards will not be determined in the FS. Per EPA's clarification, we agree to include a general cost estimate for monitoring and state the general assumptions (e.g., numbers of wells, frequency of sampling, etc.) that were used to estimate the costs. For FS costing purposes, long-term CDF monitoring costs will be estimated for a 30-year period (not in perpetuity), consistent with other conceptual monitoring cost estimates (e.g., MNR) in the FS and guidance in general.	EPA agreed this comment states a general concept that long term monitoring will be considered as a component of CDF alternatives and costing. EPA indicated that reference to ROD standards/criteria only refers to the intent of the monitoring, not specific standards that would be assumed for the FS. EPA indicated the FS should include a general cost estimate for monitoring and state the general assumptions (e.g., numbers of wells, frequency of sampling, etc.) that were used to estimate the costs. EPA indicated that LWG should use a 30-year period for the cost estimate but that the FS should state that monitoring will actually be in perpetuity or until EPA decides it is no longer needed.
28. Provide appropriate financial assurance for project development, closure, long-term monitoring, mitigation as needed, and contingency actions.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will assume and state that performing parties will need to establish such assurances as part of remedial design. Financial assurance requirements or details will not be described in an FS.	None.

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29. Implement appropriate institutional controls: • Prevent disturbance of the sediment • Prevent stormwater infiltration into the CDF or the CDF buffer zone. • Prevent installation of groundwater extraction wells for any purpose with the CDF or the CDF buffer zone. • Restrict development on the CDF. Structures may be constructed over the CDF; however, foundations must remain at least 3 feet above the upper surface of the contaminated sediment zone. Installation of piles driven through the contaminated sediment zone is not allowed. However, EPA is willing to consider proposals for jet grouted piles or other technologies that will not disturb the contaminated sediments.	Design Issue	The comment will be addressed consistent with the LWG proposed approach to design level issues as noted in response to Comment 5. The FS will discuss conceptually the level and range of institutional controls that would need to accompany a CDF alternative. However, the specific controls would not be determined in the FS, because they are dependent on the details of the specific design eventually determined.	None.